JPRS-CST-84-037

8 November 1984

China Report

SCIENCE AND TECHNOLOGY

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CHINA REPORT

SCIENCE AND TECHNOLOGY

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NATIONAL DEVELOPMENTS

MORE AUTONOMY FOR RESEARCH INSTITUTES URGED

Benefits of Paid Contract System

Chengdu SICHUAN RIBAO in Chinese 22 May 84 p 1

[Text] The provincial government of Sichuan held a conference on reforming the scientific research system at the Chengdu Institute of Electronics on 11-13 May.

The experience of implementing a scientific research responsibility system at the Chengdu Institute of Electronics was exchanged and popularized at the meeting. Opinions on the trial points of research and development units in Sichuan to convert from receiving operating expenses to a renumerative contract system were discussed. These trial points were enthusiastically attempted.

Governor Yang Xizong [2799 2649 4844] attended and addressed the meeting.

As the meeting began, Scientific Committee Chairman, standing member of Provincial Committee Song Dafan [1345 1129 0416] also addressed the meeting. Vice Governor Kang Zenghuang [1660 2182 7806] concluded the meeting with topics on "liberating our thoughts, having courage to reform, relaxing policies, and enliven science and technology."

Standing member of the Provincial Council Han Zhengfu [7281 2973 1133] also attended the meeting. Over 120 people representing local scientific committees, research institutions and related provincial departments were presented.

Director Wang Mingfa [3076 2494 4099] of the Chengdu Institute of Electronics introduced the experience of "insisting on the policy of gearing scientific research to the economy and to accelerate the reform of research institutes." Their basic experience was: (1) to implement a "contract research responsibility system" centered around "program contracting" and "program accounting" in order to mobilize the enthusiasm of the technical staff, to reinforce responsibility, and to promote scientific research; (2) to expand the applied research of microcomputers in order to save energy and to actively serve the economy with significant results; and (3) to develop laterally to collaborate with relevant institutions of higher learning, research units and plants, to cooperate with other regions such as Beijing and Hong Kong, to exchange

qualified people, and to enliven science and technology to develop an "integrated" system for scientific research, design, production, and service.

The provincial committee and the provincial government approved the experience of the research responsibility system implemented at the Chengdu Institute of Electronics and requested all the research units to follow suit.

It was announced in the meeting that the contract research responsibility system implemented at the Chengdu Institute of Electronics should be promoted in all the local independent natural science institutes. The self-determination rights of research institutes should be further expanded and policies should be relaxed to implement the following: (1) To expand personnel rights. Based on need, a research institute has the right to review and hire anyone who is transferred into the organization. It may refuse to accept unqualified people. It may also advertise for technical and management personnel from other regions and units and set its own salary levels. It may increase the size without any limitation. The director has the right to reward and punish employees, including promotion and expulsion. Those who are not suited for scientific research may be reassigned through various channels. The extra people in the institute may be allowed to resign. (2) To expand financial power. An institute is responsible for its operating expenses. It may generate income through technical services, including transfer of developed results, consulting and selling scientific research products. The money does not have to be turned over to the authority. It may be used to establish various funds in the institute. The total bonuses should not exceed two and half times of the average monthly wages. The excess over the total bonuses is handled by increasing the proportion of development funds. Individual bonuses do not have upper and lower limits. Any surplus can be transferred to the next year. The salary level of an outstanding employee may be upgraded with approval by the authority. The adjustment should not exceed three percent of the total number of employees. (3) To expand the planning power. A research institute is allowed to undertake research projects and technical services across trades and regions under the premise that tasks assigned by the government are assured. It is permitted to choose its projects. A research institute is also allowed to form joint ventures with businesses and farms and to share profits. They may accept technology transfer fees.

The meeting also pointed out that we should enthusiastically try out the renumerative contract system to eliminate government funding of operating expenses. In addition to executing the above regulations, the policies must be further relaxed for such test institutions by implementing the following: (1) To practice a director responsibility system. The director is appointed by a higher authority. He nominates associate directors and chief engineers and submits their names for approval. The leadership of departments and institutes will be named by the director for a three year term, which can be renewed. The party committee (organization) and branches have the primary responsibility of assurance and supervision. (2) The total bonuses of a test institution should be higher than that of a conventional unit. Bonuses may reach around 20 percent of the net income. Total bonuses should be about 30 percent of the annual base salary. The excess can be handled by increasing

the proportion going into the development fund. (3) A test point may choose its own salary structure according to its characteristics. The salary level of an outstanding technical worker or employee may be upgraded for one year. It will become his fixed salary after three continuous years. The adjustment should not be made for more than five percent of the total employees. Group leaders who are responsible for significant accomplishments will be reported to the authority for salary increases by one level. Those who are recognized for two years in a row will be promoted one level.

Finally, all regions and departments must support this reform. The reform of the scientific research system must be guided carefully. Various responsible organizatons must "turn on the green light" for the reform of the system. We must work closely in a cooperative manner to "enrich the people" and "promote the situation" in order to create new prospects in science and technology in Sichuan.

Relation of S&T Reform to Economic Reform

Chengdu SICHUAN RIBAO in Chinese 22 May 84 p 1

[Editorial]

[Text] Current economic reform in Sichuan looks good. Significant results have been obtained in the reform of the rural economy and is developing in depth. Based on its characteristics, urban economic reform is accelerated by absorbing the successful experience acquired in rural areas. Driven by the reform of the economic system, the reform of the S&T system began. Some beneficial attempts were made with certain results. However, the S&T system reform still cannot catch up with the economic system reform. It cannot satisfy the requirements of technological revolution and the four modernizations. We must accelerate this process in order to keep pace with the entire economic system.

Modernization of science and technology is the key to the four modernizations. Modernization, economic development, and quadrupling must, to some extent, rely on advances in science and technology. However, our past S&T system, just as our economic system, had the problem of "everyone eating from the same pot." S&T departments and research units shared the same pot. Technical and research personnel also relied on the same common pot from their own units. It did not matter how much work was done. Such a system limited the enthusiasm of the research units and technical staff to gear research to the economy. It also limited the improvement of technological standards and the development of S&T in the socialist modernization effort. Consequently, the progress of the four modernizations was affected to a significant extent. We must thoroughly execute the policy that "economic construction must depend on science and technology, and science and technology must be geared to economic construction." The development in S&T must be accelerated to meet the new technological revolution and to speed up the four modernizations. While reforming the economic system, we must reform the S&T system. Both reforms must move together and help each other forward. If only the economic system is reformed and the S&T system is not reformed at the same time, then the requirements of

the socialist modernization effort cannot be met. The entire economic construction will be delayed. The economic system reform will be less effective. Therefore, reform of the S&T system is an urgent problem to be dealt with immediately.

The S&T system must be reformed in two areas: one is to combine scientific research with production so that S&T can be geared to economic development to better serve the economy. Two is to mobilize the enthusiasm of the research organizations and personnel, and to fully develop the role of talent. In order to realize the first requirement, the government should not maintain very strict control over the management of research units. They should be allowed to choose their own research topics and to directly contact production enterprises in order to make contracts to perform research tasks as long as their assigned tasks are completed. They should be able to closely combine research with production through different types of organizations. In order to realize the latter requirement, we must eliminate the idea of "sharing the same pot." The income of a research outfit and the salary of the research staff should be directly linked with their accomplishments and contributions to the country and society. The personnel management system for technical staff must be reformed to allow certain mobility for the effective utilization of talents.

The successful experience in the urban and rural economic reform and the characteristics of technical work must be taken into account in the reform of the S&T system. The key word is "contract." We must actively promote a contract responsibility system for each program in research. This method is appropriate for scientific research which can clearly identify the responsibility and generate the enthusiasm of the vast number of technical staff members. There may be many specific types of contracts. We should not attempt to unify it. However, the basic idea should be easily popularized in all research units.

The relation between government and research units will be gradually changed to a renumerative contract system from the current direct funding system through experimentation at test points. Contracts should be signed for all research tasks assigned by the government and development projects sponsored by relevant departments and production units. Operating expenses are derived from paid contracts. Research institutions, in this case, must take in contracts from the government and sponsoring organizations so that research efforts are directly linked to the operating expenses. The technical and economical responsibilities of a research institution can thus be clearly identified to overcome the problem of "sharing the same pot."

The pressure and vitality of a research unit can be increased to promote the combination of research with production in order to contribute to the four modernizations. After the renumerative contract system is implemented, a research unit is still a business unit. An economic responsibility system centered around program contracting and accounting must be established internally to allow a topic group and the technical personnel to subcontract a program from the leadership. We must also establish a personal responsibility system from the dictatorship to the managers of various laboratories.

Each person will be rewarded or punished according to his accomplishments. By doing so, the hard working people will be rewarded and the lazy ones will be penalized. The problem of "sharing the same pot" can be resolved. Every employee will then work enthusiastically to perform the research duties; thus contributing to the four modernizations. The Chengdu Institute of Electronics has acquired considerable experience in establishing a healthy economic responsibility and system of personal responsibility. They focused on the development of energy saving microcomputers and obtained significant results with created new prospects. All research and development institutions should study the actual situation to create the condition to expand the successful experience of the Chengdu Institute of Electronics in order to push the reform of the scientific research system forward.

Leading bodies at various levels and technical departments must strengthen leadership in the reform of the S&T system. We must continue to eliminate the influence of the "left" ideology, further liberate our thoughts, be bold to reform, relax policies, to increase S&T activities, and to effectively reform the S&T system. We must heop research institutions to bring in knowledgeable management personnel who can meet the requirements of the four modernizations. We must not be limited by rules and regulations to promote qualified people to management. Management positions in research should not be given to officials just to take care of them. Research cannot be improved and the system cannot be reformed if we do so. Leadership is the key. All relevant departments, including economic planning, finance and banking, business and taxation, and labor personnel, must actively support the reform of the S&T system. They must create conditions by turning on the green light. We must be progressive. All the old concepts, methodologies and frameworks which are not compatible with the new situation must be changed. Good experience, methods and measures which can profit the people must be promoted so that S&T system reform can proceed at the same pace as economic system reform to satisfy the needs in the socialist modernization effort.

Reform is the hope of the four modernizations. Reform is the way to profit the people and the nation. Not to reform is a deadend. Let us raise the flag of reform to take advantage of the current situation to straighten the economic and S&T system in Sichuan in order to create new horizons to greet new victories in socialist modernization construction.

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CSO: 4008/342

HEBEI TO IMPLEMENT REFORM OF S & T RESEARCH INSTITUTES

Hebei Reform Regulations Issued

Shijiazhuang HEBEI RIBAO in Chinese 24 May 84 p 5

[Text] In order to rapidly develop scientific research in Hebei, the provincial government has issued and implemented regulations on the reform of the research institute system.

A director responsibility system has been implemented. A director will be chosen or elected on the basis of reorganizing a research institute. The nomination will have to be approved. The term is three years with provisions to renew. The director can be removed by his superior for incompetency or corruption. He will have the authority in matters of personnel, business and finance. He is totally responsible for the research effort in the institute. He can appoint associate directors and laboratory managers, and discharge them for inadequate performance.

Scientific and technical personnel are encouraged to move around. A research institute has the right to retain technical personnel from another organization for joint research or consulting service. It may also sign retired or self-educated technical people into contract on a short or long term basis according to the need. They will be laid off when the need no longer exists. A research institute shall employ mostly contract workers to temporary workers instead of permanent workers.

The operating expenses of research institutes primarily engaged in applied research and development will gradually be derived from compensations received from performing contracts. A direct linkage between investment in the research institutes and research tasks will be made. Research institutes will perform assigned programs and are paid according to contracts. If a contract is completed, it will be compensated accordingly. The institute will be rewarded if the work is done ahead of schedule and penalized if the work is not finished in time.

The scope of technical service should be expanded to broaden sources of income. An institute may accept research projects from other trades, departments and regions with the assurance that directly assigned programs can be completed. Accomplishments in scientific research belong to the country. They should be utilized within the trade, region and department. We should also allow their transfer to other trades, departments and regions with

compensation. Various technical consulting services should be exploited. More incomes can be derived from conduits such as contract research, royalty from inventions, testing scientific products and consulting services.

The right to distribute should be expanded. A performance allowance system is implemented in scientific research institutes. It should have the right to promote outstanding employees and adjust their wages upward. It also should have the right to demote employees who have not performed over the long run and cut their salaries. The amount of bonuses is no longer controlled as a certain percentage of the total base salary. It should be adjusted according to the accomplishment and income level of the institute. There is neigher an upper nor a lower limit.

The government and relevant departments are supporting the reform of research institutes. In order to ensure that research institutes can grow, no income taxes will be levied for five years against those not receiving any government funding. If the annual income derived from production is below 10,000 yuan, income taxes are also exempt for five years. It is only taxed at a certain rate for the amount in excess to the amount mentioned above. The managing department does not take any part of their income. The net income remains with the institutes to improve the research facilities and operating conditions. A scientific research fund is accumulated for employee benefits and bonuses.

Key Issues in Reform of S&T System

Shijiazhuang HEBEI RIBAO in Chinese 24 May 84 p 5

[Text] The Hebei provincial government has issued two documents regarding the reform of specialized research institutes and agricultural S&T. We must sincerely collaborate and seriously implement them in order to create new situations through reform of S&T in Hebei.

Reform of the S&T system which is not suited to the four modernizations and to solve the series of problems in economic policies are the key issues to stimulate S&T as well as the economy in Hebei. The current S&T system has too many pitfalls. S&T are not closely linked to production. Manpower and materials are scattered. There are too many duplications and too much waste. It is divided into various departments without any coordination. It is heavily dependent on the government without any mobility and initiative to develop by itself. If it is not fundamentally reformed, it will be very difficult to contribute to the four modernizations effectively.

The guiding ideology of S&T reform is to rely on the people and society to fully mobilize the vitality of S&T to contribute to the economy of the province by adopting a technical responsibility system. The reform is mainly centered around two issues: to gear S&T to the economy to overcome the separation of research from production, and to fully develop the role of scientific and technical personnel.

The reform of the S&T system is a huge and difficult task. It involves the reform of the economic, financial and personnel systems. The reform of the

S&T system must be done in a compatible and synchronous manner. Through the reform of the S&T and the economic systems, the problem of insufficient dependence of the social and economic departments on S&T can be resolved. A technical structure where S&T is coordinated with the economy and the society will be created. We must continue to eliminate the influence of the "left" ideology and to encourage devoted comrades to challenge old concepts and methodologies.

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CSO: 4008/342

DISCUSSION ON REFORM OF S&T SYSTEM

Socialization Is Key

Beijing GUANGMING RIBAO in Chinese 19 Jun 84 p 2

[Article by Wang Cailiang [3769 2088 5328] of Ministry of Petroleum Industry]

[Text] The S&T system must be reformed by following the laws of development in S&T using a socialization method. We must break free from the small scale production style of "unit ownership," "departmental ownership" and "regional ownership" in order to open new horizons for science and technology.

1. Socialize Scientific Research. The potential of scientific research units is tremendous. In the past, management only allowed research to serve "us." Otherwise, one would be accused of "ignoring one's duties" and had "problems in one's orientation." The capability of science and technology was hampered. The implementation of a remunerative contract system must not be limited to a department or a region. The scientific research community must be allowed to face the nation and society to demonstrate their capabilities.

2. Socialize S&T Personnel. Talents belong to the nation. We must break free from "unit ownership" and "departmental ownership" and adopt a personnel management standard so that talents are fully utilized in most appropriate positions. We must allow talents to move around to areas where they can be best utilized. S&T personnel should be allowed to hold two or more jobs concurrently, including participation in more than one topic in the institute.

3. Socialize S&T Information. Scientific research is an information industry in which information is processed and produced. S&T information must be socialized to create a national network of information exchange and retrieval. We must socialize S&T publications by creating more conduits for publishing journals and periodicals. S&T activities must be socialized and publicized to avoid duplication. We must also socialize S&T accomplishments to facilitate further promotion.

4. Socialize Exchange of S&T Accomplishments. The establishment of some regional S&T service companies should be promoted and supported. Each trade can also establish a similar organization to organize cooperation and popularize results. These organizations must be united, work in concert and form a

network to popularize S&T results throughout the nation so that other regions and trades can also be served.

5. Socialize Assurance for Scientific Research. Scientific instrument companies of the scientific committee and local levels should be fully developed. Various trades and departments may also establish similar service companies. These companies should interact and form a network so that research personnel can avoid running around looking for equipment.

In addition, service such as analysis, testing and computation must be socialized. The utilization rate of certain instruments or equipment in a research organization are low. Many relevant workers are underutilized. We should support public analysis and testing centers and computation centers already established in some areas. Special tax considerations should be given so that the government can subsidize them in the near term to reduce the fees charged to the public. We must change the "small but comprehensive" image of a research organization.

6. Socialize Welfare Benefits. Many research organizations become small communities with heavy burdens. The city and county governments should focus on social welfare. They should attempt to operate independent service companies by themselves, or in conjunction with research organizations in the area.

Private Research Institutions

Beijing GUANGMING RIBAO in Chinese 19 Jun 84 p 2

[Article by Yin Naide [3009 0035 1795] of Yin Naide Non-metallic Electroplating Research Institute in Suzhou]

[Text] The majority of the present S&T organizations in China belong to the people; some are collectively owned. I believe that we should permit a small number of private research institutions to exist as a consequence of the reform of the S&T system. This not only coincides with the policy of the Party Central Committee to allow various economic systems to co-exist, but also is a beneficial attempt to stimulate the Chinese technical market, create conduits for people to move on, and fully develop the enthusiasm of scientific and technical personnel. Early this year, I submitted an application to Suzhou city for establishing a private non-metallic electroplating research institute. It was approved by the Scientific Committee of Suzhou last May.

Some of the ideas in founding this private research institute included the selling of technology in the first couple of years as the working capital and to the extent possible, not borrow from the government. Therefore, we will offer technical consulting, carry out research projects, and provide technical service. According to the amount of capital accumulated in the third or fourth year, we plan to build laboratories. In summary, we will survive and grow by selling our technology and accomplishments. In the area of personnel, we will openly advertise and carefully select people with the pertinent

knowledge and moral conduct. In addition to academic background and working experience, the emphasis is focused on the actual capability. We will choose dedicated, hard working and innovative people to join us. All the employees, including myself, will be paid by wages and bonuses. The salary will be determined by the individual capability (academic background will be used as a reference and working experience will not be considered). Furthermore, it is tentatively decided to review the salary every three to five years. In principle, it will gradually increase. For those who made significant contributions, their salaries will definitely be raised. The mediocre ones, who have no accomplishment in 3 years, will stay at the same level. Those without any accomplishments in 5 years will be demoted. A fixed proportion of the compensation received by the institute derived from the acceptance of our new technologies and new products by production organizations and will be awarded to the personnel directly involved in the project. Starting from the third year, all employees will enjoy every benefit offered to the employees of national enterprises.

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RENMIN RIBAO ON PRODUCTION OF CHEMICAL PRODUCTS

HK121052 Beijing RENMIN RIBAO in Chinese 5 Oct 84 p 1

["Facts and Figures" column: "The Chemical Industry Can Produce Over 30,000 Standard Products"--date provide by the Ministry of Chemical Industry]

[Text] China's rising chemical industry has undergone rapid development since the founding of the state. Presently there are 19 trades under the Ministry of Chemical Industry which are capable of producing over 30,000 standard products. In 1949, the national chemical industrial output value was just 170 million yuan. The figure has increased to 49.17 billion yuan in 1983. From 1952 to 1983, the average annual increase in the gross chemical industrial output value was 8.97 percent. The proportion of chemical industrial output value to the gross national industrial output value has increased from 1.6 percent in the early days of the founding of the state to the current 8 percent. From 1949 to 1983, the chemical industry has delivered to the state profits and taxes equivalent to three times the investment sum vested inthe industry by the state during that period.

In the early days of the founding of the state the output volume of the chemical fertilizer industry was just 5,700 tons. The figure increased to over 13.78 million tons in 1983, while the industry's varieties of products have developed from one to more than 10. The production of agricultural chemicals has changed from synthesizing raw chemicals to processing medicine. In 1983, the output volume of the agricultural chemicals industry was more than 330,000 tons. In addition, the industry also produced large quantities of such products as plastics for agricultural use, tires, pipes, and plastic belts.

It also provides chemical products in large amounts to help develop light and textile industries. The industry currently produces soda ash year round throughout the state. Thirty-five percent of the annual output is used by the class, enamel, detergent, and other industries. It also produces caustic soda, 70 percent of which is used for the production of paper, artificial fibers, dye products, soaps, and so on. The industry also annually produces more than 7,000 bicycle tires for assembly and replacement, and more than 70,000 tons of dyes so that 90 percent of the textile industry's demand can be met domestically. The chemical industry annually produces more than 130 million meters of color movie film, accounting for 74 percent of the gross national output volume of color movie film.

In 1983, the state's chemical industry system produced over 160,000 tons of synthetic rubber and over 1.04 million tons of plastics. The plastic produects are widely used in such areas as packaging materials, electrical materials, furniture, component parts of manufactured goods for daily use, transport materials, building materials, and so on. It also produces various artificial organs from organic silicone rubber, so that patients are able to work again. In line with theproduction of atomic and hydrogen bombs and the launching of artificial earth satellites, and the trial production of large-scale integrated circuits and computers, the chemical industry provides various raw materials with required special characteristics.

The chemical industry also researches and developes on a large-scale new products, techniques, and technologies. The success in testing the carbonization process resulting from the combined production of synthetic ammonia and ammonium bicarbonate enables the nation's small-scale production of nitrogen fertilizer to develop rapidly. Presently, the output volume of this product accounts for 56.8 percent of the gross national output volume of synthetic ammonia. In addition, the success in developing the technology of producing maliec rubber has enabled the state to increase the annual output volume of maliec rubber to 82,000 tons.

CSO: 4008/61

BENEFITS OF PATENT SYSTEM DISCUSSED

Beijing FAMING YU ZHUANLI [INVENTIONS AND PATENTS] in Chinese No 4, 1983 pp 3-5

[Article by Ren Jianxin [0117 1696 2450], President of the China Branch of the International Association for the Protection of Industrial Property and Vice Chairman of the China Council for the Promotion of International Trade: "Build a Patent System, Promote Scientific and Technological Development"]

I

[Text] Our government has decided to establish a patent system. In accordance with this resolution, the state has set up a patent bureau as well as a patent agency in the China Council for the Promotion of International Trade. China is now speeding up the formulation of the patent law. I wholeheartedly support this resolution of the government.

The China Council for the Promotion of International Trade is a civil organ which promotes China's economic relations and trade with foreign countries. For many years it has done a great deal of investigation and research on the issue of a patent system, and through its work and practice it strongly feels that establishing a patent system in China is both necessary and urgent. In 1973, I attended the conference of the International Property Rights of Knowledge Organization in Geneva as an observer. This was the first time China sent a delegation to participate in an international conference concerning patents. During the period of the conference, we conducted many rounds of discussion on the pros and cons of a patent system with delegates from different countries including Romania, Algeria, Egypt, Mexico, Switzerland, France, West Germany, Japan, Canada and Australia. A relatively detailed report was written on this and the following advantages of a patent system were discussed: (1) It will be beneficial to the collection of large quantities of patent documents from various countries, the understanding of international trends in science and technology and the promotion of scientific research and industrial production in one's own country; (2) it will be beneficial to the introduction of new technology, the protection of inventions and the growth of import and export trade in one's own country; (3) it will be beneficial to the participation in international conventions and treaties, enjoyment of preferential provisions and protection of the interests of one's own country; (4) it will be beneficial to supporting the struggle of developing countries against Western capitalist countries on the issues of technology and patents. Leading comrades concerned in the central government

paid rather special attention to our report and had entrusted concerned departments to study the question of patents. On related occasions, Premier Zhou Enlai had also inquired about the state of development, but for various reasons this matter was put aside. Nonetheless, in promoting import and export trade, the China Council for the Promotion of International Trade cannot avoid encountering numerous problems on patents. In view of the fact that China has no patent system, some problems are very hard to deal with.

Since the Third Plenary Session of the 11th party Central Committee, China has implemented the policy of enlivening the domestic economy and opening up to the outside world, stressed the strengthening of economic cooperation with all countries on the basis of self-reliance, made efforts to use advanced technology and equipment in the world to develop science and technology in China. Comrade Hu Yaobang said at the Second National Congress of the Chinese Science and Technology Association: "Science is an enormous force that moves history forward. Science is rapidly being transformed into an enormous productive force. The four modernizations cannot do without advanced science and technology. Getting a firm grasp of today's most advanced science and technology is an essential question that concerns the future of our country." Comrade Zhao Ziyang said in his "Report on the Sixth 5-Year Plan": "Economic revitalization must rely on progress in science and technology while scientific and technical work must be geared to the needs of economic construction. This is an essential question of principle.... If we stop at the present backward level of technology we will not succeed in quadrupling the gross annual value of industrial and agricultural output by the year 2000." In order to develop science and technology, our government has adopted and is continuing to adopt many effective measures, one of which is the resolution to establish a patent system.

II

The rapid growth of industry in the world during the last hundred years is directly related to the emergence of innovations; we cannot talk about industrial development without inventions. The patent system plays the role of a catalyst in the large-scale emergence of innovations. Our is a big country abound with natural wealth and potentialities of talents. A patent system will enable inventive enterprises and individuals to receive spiritual encouragement and material benefits. This will not only make it possible to recover the expenses on research and provide more financial resources to further their work on new inventions but will also overcome the mentality of "eating out of the big pot" among other enterprises thereby compelling them to innovate. It will not merey promote enterprises to pay attention to economic accounting, avoid duplication of labor and improve management and administration but will also encourage them to pay attention to the training of personnel. This will play a role in the development of talents, the growth of enterprises, scientific and technological progress and the prosperity of the state, which cannot be ignored.

Establishment of a patent system is beneficial to understanding the latest trends in science and technology. Some of the patent applications will originate from foreign countries and 90 to 95 percent of all scientific and technical literature in the world come from patent documents. Moreover, all patent applications from foreign countries must be made in Chinese so that this will gradually build a vast Chinese-language scientific and technical resource center in our country. In another respect, for enterprises in China, all inventions that apply for patents will be made public and can be made available for use by other enterprises with compensation. This will help to break the seal on technology in the country and promote technical progress. Otherwise, many innovations will be treated as "secrets" and sealed off, which will not favor the technological transformation of China's enterprises or their innovation from a starting point at a higher level. After a patent system is set up, China will also publish a patent bulletin to put forth patent applications made in China. In accordance with international customs, patent bulletins can be mutually exchanged so that it will benefit the collection of technical information from various countries to be used for reference.

Establishing a patent system will be beneficial to the development of import and export trade in China. The important prerequisite for the development of import and export trade is to benefit both trading parties at minimal or no risks. When one of the two trading parties does not have a patent system, the sense of insurance will be reduced or disappear. Since China is still without a patent system, regardless of protection by contract provisions, there are still numerous problems judging from past experience. For example, foreign enterprises rarely sell us the most advanced technology or products of the most advanced technology because they believe they have no legal safeguard. When foreign enterprises sell us relatively advanced technology or products of relatively advanced technology they often raise prices by varying degrees. In another respect, because China does not have a patent system, some enterprises within the country generally lack patent knowledge and there have been numerous examples of them being cheated. For instance, when some foreign merchants sign license contracts with us, they include fees for the use of expired patented technology with those for currently patented technology. Some enterprises do not know how to protect the technology of their products in foreign countries; their patents are even applied for by other people while our own products cannot be exported. Moreover, some countries do not allow China to apply for patents in accordance with the principle of reciprocity because we do not have a patent system and consequently our technology cannot be protected by law in those countries and we suffer economic losses.

The economic policy of opening up to the outside world and the development of economic cooperation with foreign countries are of great strategic significance to the realization of quadrupling China's gross annual value of industrial and agricultural output by the end of this century. A patent system is an indispensable measure in developing economic cooperation with foreign countries. The numerous forms of economic cooperation such as joint ventures, cooperation in management, cooperation in development and compensatory trade often have an inseparable relationship with the transfer

and use of technology. Without a patent system, it will mean that the technology in concern cannot get effective legal protection and will cause worry among those who cooperate. Although China already has the "law for enterprises in Chinese-foreign joint ventures" and has specified in Article 5 that industrial property can be used as an investment, if this is not kept up by a patent system foreign countries will be full of worries when they invest with technology in joint ventures, and in particular they will not readily invest with advanced technology.

III

What kind of patent system should China adopt? What kind of patent law should it formulate? This is an important issue which Chinese and foreigners are very concerned with. I believe that we should consider and resolve this issue in accordance with the three principles for the work in the laws of China's economic relations and trade with foreign countries which were approved by Comrade Zhou Enlai in the early 1970's, namely maintaining independence and keeping the initiative in one's own hands, implementing equality and mutual benefits and using internatinoal practice as reference to consider and solve this question.

How do we maintain the principle of independence and keeping the initiative in one's own hands? China's patent system should neither simply copy the ways of Great Britain, the United States and other Western countries nor apply indiscriminately the Soviet system of inventors' certificates, but should be based on our national conditions and absorbing the strong points of patent systems in all countries. Ours is a socialist country where the absolute majority of inventions are made on the job. Patent rights belong to the unit of the inventor and the inventor can be rewarded and compensated according to the extent of the economic results and contribution of the invention. The unit that obtains the patent rights should not refuse to allow other units in the system of public ownership to use its invention but may obtain a fee from other units in the system of public ownership. Patent rights do not have to be granted to inventions which are not in accord with public interests and socialist morality.

How do we implement the policy of "equality and mutual benefits"? I believe that under the prerequisite of safeguarding state sovereign rights, we can accept patent applications from foreigners and grant them the right of priority in accordance with treaties or the principle of reciprocity. That is, besides mutual acceptance of applications according to treaty terms, China can also reciprocally accept patent applications from those countries which accept China's patent applications without having to draw up prior agreements, and the same principle can be applied in the right of priority. When accepting applications for registered trademarks in the past, China's system of trademarks required the home countries of the applicants to reach written reciprocal agreements on registered trademarks, which became very troublesome. Negotiations sometimes lasted for several years and did not benefit economic relations and trade. I believe that in China's patent law, treatment based on the principle of reciprocity is more convenient. With regard to the conditions in obtaining patents as well as the rights

and obligations of patentees, I believe that in principle they should be given national treatment. This will be beneficial to unified implementation of patent law and the development of economic relations, trade and technical cooperation with foreign countries.

How do we "use international practice as reference"? It means that we adopt some common international practice on the prerequisite of doing no damage to the two principles mentioned above in order that our patent law is in tune with the patent laws of most countries as much as possible. I believe that the acceptable major customs are: adopting the system of substantive examination for inventions for which patents are applied in order to safeguard the quality of patents and curtail the number of lawsuits; adopting the methods of early publication and deferred-examination for patent applications to enable us to gain an early understanding of technological trends, prevent duplication of scientific research and lighten the workload of the patent bureau; adopting the system of first-come applications used in a majority of the countries, by which patent right is granted to the first applicant for the patent; granting no patent protection to inventions in the minor realms of technology depending on circumstances; providing a reasonable period of patent protection of approximately 15 years; and stressing the implementation of patented inventions in order to promote the growth of science and technology. In short, I believe that China's patent law must be in accord with national conditions and acceptable to the majority of countries.

IV

For many years the China Council for the Promotion of International Trade has repeatedly analyzed the pros and cons of the patent system and truly believes that establishing a patent system and supplementing it with effective measures will actively promote the development of science and technology in our country. In recent years, the council has actively assisted in the patent bureau and department concerned to draft the patent law, and it is hoped that a patent law which is in accord with our national conditions will soon be promulgated and put into effect.

At present, the China Council for the Promotion of International Trade has set up a patent agency which handles matters relating to applications by our enterprises for patents in foreign countries. After China's patent law is promulgated and takes effect, it will also act as agent for foreigners in their applications for patents in our country. The council has already drawn up the "Provisional measures for applications for patents in foreign countries on behalf of enterprises, organizations and individuals in China" and in the future it will also draw up the "provincial measures for foreign enterprises, organizations and individuals applying for patents in China." To do its best in the related work, the patent agency of the China Council for the Promotion of International Trade is actively making preparations. In the past 30 years the council has always acted as agent for trademarks and has maintained wide connections with foreign lawyers for industrial property, which is highly beneficial to our work as agent for patents. In order to promote the development of China's system of industrial property even better,

in August 1982 we established the China branch of the International Association for the Protection of Industrial Property. The main tasks of this branch include: (1) studying the system of industrial property that suits China's national conditions and making proposals to the main concerned departments in charge; (2) propagating and popularizing China's system of industrial property; (3) investigating and studying concerned problems of international industrial property and making prompt proposals to the government and concerned quarters; (4) on the basis of restructuring the world economic order, promoting the development of the system of protection of international industrial property, strengthening the cooperation among legal circles for international industrial property and promoting extensive contact and professional connections with concerned organizations, lawyers of international industrial property rights in all countries and other concerned personnel. As a next step, China should actively consider the question of participating in the Paris convention. Provisions in the Paris Convention relating to national treatment, right of priority and provisional protection are mutually beneficial to the signatory states and we should make use of these provisions. Of course, quite a few portions of the Paris Convention are not in tune with the action program for building a new international economic order which has been approved by the Sixth Session of UNCTAD and negotiations for an amendment is necessary. We hope we can exert our effort together with developing countries in building a just international system for the protection of rights in industrial property.

9586
CSO: 4008/108

RELATIONSHIP OF PATENT SYSTEM, COMMODITY PRODUCTION DISCUSSED

Beijing FAMING YU ZHUANLI [INVENTIONS AND PATENTS] in Chinese No 4, 1983 pp 6-9

[Article by Yi Zhi [2496 0037]: "Patent System and Commodity Production"]

[Text] China is actively preparing the establishment of a patent system.

The formulation and promulgation of the patent law and building a socialist patent system is a major event in China's economic legislation and the restructuring of the administrative system for achievements in scientific research; it is also a major result of bringing order out of chaos in the realm of economic thinking and removing "leftist" ideological influence since the Third Plenary Session of the 11th party Central Committee. It is of great significance to China's intellectual development, technological progress and economic growth.

An Inevitable Outcome of Fully-Developed Commodity Production

Although a patent system develops along with the development of the capitalist system, it is not something unique to capitalism but is an inevitable outcome of commodity production when fully developed. Capitalist states no doubt proceed from the capitalist principle of the sanctity and inviolability of private property in granting patent protection to technological inventions and safeguards bourgeois monopoly on technological inventions, but it reflects the objective demands of economic and technological progress. This is because under the social economic condition of fully developed commodity production, technological invention is itself a kind of commodity. But because it has characteristics that are different from commodities in general, only by relying on the force of state political power to give it patent protection can the course of its expanded reproduction be carried out normally. Marx said: "The only value known to economics is commodity value." ("Collected Works of Marx and Engels, Vol 20 p 331) Only by getting a clear idea of the question can we have a correct understanding of the patent system.

A commodity is a product of labor produced for exchange and possesses the dual attributes of use-value as well as value. This is the same for an invention.

Following the development of modern science and technology, the division of disciplines is becoming increasingly elaborate and more and more scientific and technological research work is carried out and concentrated in specialized research organs. Like workers directly involved in the production of material products, the work of scientists and technicians is labor of material production and is a link in the overall process of great socialized production. Just like their investment on opening factories and producing material products, capitalists invest on opening research institutes for the sales and to reap the surplus value. Invention for the purpose of exchange is a major characteristic of modern scientific and technical research work. Even if a factory owner operates his own research institute, its inventions are used for production in his own factory, but it is also a commodity and has value, which is included in the value of the products produced by the factory. This is invention for the purpose of exchange and is not a matter of self-sufficiency.

Like the value of commodities in general, the value of invention is embodied in the society's necessary labor of the invention and its composition likewise includes the three part of C + V + M. C stands for the consumption of various materialized labor in the course of research and experiments, such as the consumption of raw materials, materials and energy, and the depreciation of factory buildings, machine equipment and various instruments used for experiments. V stands for the consumption of live labor by scientists, technicians and workers in auxilliary labor in the course of experiments for scientific research. M stands for surplus value, which is profit under socialist conditions. The use-value of inventions is the ability to resolve the difficult technical problems in production and other human activities and the transformation of the possible potential productive force in the invention through its use into an actual and direct productive force. Therefore, it is an extremely important factor among the numerous factors of productive forces, a strong measure to gain wealth and compete.

However, technological inventions differ from commodities in general because they have their own characteristics. First, they are invisible. Commodities in general are material products and have their own material forms. Inventions are products of labor in intellectual form, which are without their own material form of substance, only blueprints, directions, design plans, manuals and technical literature. Although some inventions have models, parent seeds and other material carriers, they are not the inventions themselves. As a result, technological inventions are often regarded as "invisible commodities" without the problem of visible wear and tear, but the effects of invisible wear and tear is most important. Along with the endless appearance of new and even better inventions, the original vitality of inventions continue to disappear. Second, in the makeup of its value, the primary value is that of live labor, particularly creative mental labor. Third, the form of transfer of the use-value is different. To obtain the use-value of clothing, bicycles and other substantive commodities it is necessary to do so through the market by which money (or an account transfer or a credit card charge) is exchanged for the merchandise in purchasing it or renting it. But because technological invention is a commodity in the form of knowledge, it is not necessary to

obtain its use-value through the market or pay any compensation. All one needs is to obtain the knowledge in concern and to be equipped with the conditions for using it. Fourth, the degree of deviation between its price and value may be greater than commodities in general. Commodities in general are affected only by the relation of market supply and demand, which frequently causes price and value to deviate from each other. Because inventions are commodities in the form of knowledge, the factors in their price formation are more complex. It is affected by the relation of market supply and demand of technical know-how and also by the relation of supply and demand of material products. Therefore, the possibility of deviation between its price and value is even greater. However great a price one has paid for an invention, if someone else gets ahead of you, you may not be worth anything. Because such commodities as technological inventions possess the above series of characteristics, it is highly necessary to have legislation to protect the enjoyment of patent rights of inventors (or their successors) for a certain period of time and to protect the normal circulation of such commodities according to the demands of the law of value. Without such protection, the enormous amount of labor expended by the inventor will not be compensated and the value of inventions cannot be realized in a normal way, and people will not engage themselves in inventions or they will seal off their inventions tightly. This is not beneficial to intellectual development, technical progress, and economic and social development. The 16th President of the United States, Abraham Lincoln, had these famous words: "The patent system adds the oil of interest to the fire of talents." History has proved that these words are reasonable. Just as Lenin pointed out, in a capitalist society "all things--not just land but even human labor, human personality and even conscience, love and science are certainly things that can be sold." (Collected Works of Lenin, Vol 12, p 282) China must strictly prevent and firmly oppose the tendency of blindly developing such commodities. However, inventions are commodities themselves and those who engage in inventions are not in spiritual production but material production. Legal protection of inventions in their normal circulation in accordance with the principle of exchange of equal value is entirely different from the commodity development of personalities, conscience, love, science and others. We cannot mention them in the same breath or confuse the two.

Socialist Economic Management of Scientific and Technological Results

Since commodity production and commodity exchange exist in a socialist society, the objective foundation for building a patent system also exists. Establishing a patent system in China and managing the results of scientific and technological research with economic means is a need to turn around the situation of "eating out of the big pot" and implement the need of the principle of exchange of equal value and distribution according to work. It is also a need to develop international technical exchange and better introduce advanced technology from abroad.

The foundation of the socialist economic system is the socialist system of public ownership of the means of production in which the state-operated economy is the leading force of the entire national economy. Although the means of production of the state-operated economy are owned by the whole

people represented by the state, they are divided for management and use by each and every enterprise. According to the demands of large socialized production, each enterprise is a relatively independent economic body and should operate independently under the guidance of the state plan. Like factories, scientific research units should carry out specialized production and economic accounting, rely on the income of the products they sell (inventions) to compensate for their expenditure (scientific research funds). The economic relations between scientific research units and factories should be the same as those between factories in carrying out exchange of equal value. If this can be achieved, it will further mobilize the enthusiasm of scientists and technicians as well as scientific research units, push forward close unity between scientific research and production as well as economic accounting of scientific research units and production units and promote an increase in macroeconomic benefits. However, in order to do this we must recognize the commodity attributes of inventions and organize the reproduction of inventions according to the intrinsic attributes of inventions themselves. For this reason we must establish a patent system.

Previously, even when we did not recognize the means of production as a commodity and did not recognize the right to keep the initiative in the hands of enteprises, we still had pricing and accounting for the means of production in general and we still had allocation and transfer and even the transfer of accounts between the state and enterprises or among enterprises themselves. However, if we do not even recognize the "outer shell of commodity" of inventions, then we are in no position to talk about pricing, accounting and account transfer. As scientific research funds are reimbursed for what is spent, achievements can be used by anyone without having to pay for it. When capital construction or production use scientific research achievements, regardless of how much had been paid for them, their cost is not included in the project or the price of the product. For more than a decade or several decades, the specifications, designs and production technology of quite a few of China's products have been under the "uniform system." Production and scientific research have been out of line with each other for a long period of time, cost management has been in confusion and the price system (prices of products, prices of projects) has been seriously irrational, which are closely related to "eating out of the big pot" in scientific research achievements. Since the Third Plenary Session of the 11th party Central Committee, through bringing order out of chaos we have initially restructured the system of economic management and everyone has a clearer understanding of the harmfulness of "eating out of the big pot." However, merely by not conscientiously resolving the problem of commodity attributes of technological inventions, the entire situation of "eating out of the big pot" may not truly be turned around.

In recent years, the unhealthy tendencies of sealing off technology has been rather widespread. Some comrades attribute the source of these unhealthy tendencies to royalties for patents in scientific research achievements. They also believe that implementation of a patent system will intensify this sealing off of technology. This is erroneous and is a misunderstanding of the patent system. The present unhealthy tendencies of technological seal-off are created by "eating out of the big pot" for a prolonged period

of time. In the past, enterprises did not have the right of self-initiative. Whether it was the supply of production conditions or the distribution of products or profit, everything was in one "big pot," with all income handed over to the higher authorities and all expenses reimbursed. Although scientific research achievements are an important means to gain wealth, their adoption and the effects of their adoption were of no direct interest to enterprises, scientific research units, scientists and technicians or workers, so that there never arose the problem of technological seal-off resulting from a difference in interests. Along with the initial restructuring of the system of economic management, the state monopoly of revenue and expenses was broken down and enterprises have gained their relatively independent rights and economic interests. With a certain amount of competition, they naturally use scientific research achievements as their own means of gaining wealth. Under these circumstances, no one wants the "big pot" of scientific research achievements without royalties, and royalties for patents emerge as the times require. However, royalties for patents lack legal protection so that this causes the problem of technological seal-off because of the worry that the benefits they deserve cannot be realized. In building a patent system, the state will grant the patent right to the inventive unit or inventor and guarantee the deserved benefits as a price to exchange for the publication of the invention so that the invention will change from an exclusive wealth of a unit into a common wealth of the society. This is similar to the state recognition of copyright of a written work in exchange for its publication. Implementation of the patent system therefore will not intensify technological seal-off but will only favor breaking the technological seal-off.

When Marx discussed international trade he pointed out that in the world market commodity value is not calculated on the basis of the necessary labor of the internal society of a country but on the necessary labor of the world society, that is, the "average unit of world labor." This principle concerning the international value of commodity is also appropriate to technological trade between countries. "Science and technology are wealth commonly created by mankind" ("Selected Works of Deng Xiaoping," p 88); their dissemination and popularization are regardless of the boundaries of states and nationalities. China's modern science and technology are backward and ther realization of modernization necessitate the introduction of large quantities of advanced technology from abroad. During the last 3 years of the Sixth 5-Year Plan alone, 3,000 projects of technology had to be introduced for technological transformation of old enterprises. No doubt, foreign merchants export technology to China for the sake of gaining superprofit higher than the average profit in the world. If we introduce technology we certainly must pay a high price, but ultimately it is a much bigger savings than the time and expense we would have to spend if we were to start from the very beginning. Building a patent system will be beneficial to introducing advanced technology based on normal international prices and to developing international technological interchange. Because we have no patent system, when we introduce technology we can only state clearly on the contract for the specific item our obligation not to transfer it. But a contract is a commerical document. Even with our signed contract people remain worried about the absence of legal protection and are therefore

unwilling to export advanced technology or they demand a higher price. For example, when we introduce a technological project it is only a one-time transfer. Because we have no legal protection, they would want to charge us for all the transfers we are liable to make throughout China. This would far exceed the normal international price. Thus, building a patent system is for the sake of introducing advanced technology and extensively developing the need of international technical exchange.

Drawbacks of the Patent System

Does the patent system have drawbacks? Certainly.

Since the patent system is a management system for technological inventions which are related to the commodity economy, then all the drawbacks of a commodity currency system may exist in the patent system itself. We cannot regard the commodity currency system as flawless and certainly we should not treat the patent system as flawless. However, just as socialist commodity currency system differs in principle from the capitalist commodity currency patent system, socialist patent system also differs in principle from the capitalist patent system. Only if we maintain a sober mind, give full play to the superiority of the socialist system, adhere to the policy of a planned economy supplemented by market regulation and strengthen political and ideological work, it is entirely possible for us to minimize the drawbacks and negative role of the patent system.

The means of production in a socialist society is publicly owned. State-operated scientific research units are set up by state investment just like state-operated factories; scientific research funds and the means for research and experiments are generally provided by the state; scientists and technicians receive their wages from the state, their inventions are generally those on the job and the right of ownership belongs to the state. However, because each state-operated scientific research unit or state-operated factory is a relatively independent commodity producer, its inventions are also similar to the means of production which it manages and uses and it has its own relative rights. This is the objective basis that scientific research units or enterprises can be regarded as patentees and is also the main basis for building a patent system in a socialist society. This differs from capitalist patent right belonging to the inviolable rights of private property. Socialist patent right belongs to the relatively independent right of self-initiative of the scientific research units or enterprises. This is the difference in principle between the socialist patent system and the capitalist patent system, and is therefore an important condition for a socialist society to limit the negative role of the patent system.

Since China's economy is diversified at the present stage, our patent law will also protect inventions unrelated to one's job such as those which individual households and staff workers achieve in their spare time relying on their own equipment. This also differs from the nature of the property right of inventions unrelated to one's job which is protected in capitalist states. In capitalist countries the property right of inventions unrelated

to one's job belong to the capitalist economy while China's inventions unrelated to one's job belong to the socialist economy. Moreover, such inventions are generally minor and the patents they get are also "minor patents." The granting of this type of patent is more beneficial than harmful.

The socialist economy is a planned economy built on the foundation of the system of public ownership of the means of production. The main portions of scientific research, production and capital construction are carried out according to a plan. This is an important manifestation of the superiority of the socialist system. The socialist patent system must adhere to the guidance of the state plan. In addition, carrying out a patent system is beneficial to incorporating the management and popularization of scientific research achievements into the state plan so that the planned economic system will become even more perfect. For instance, duplicated research, construction and production are long-standing problems in China's economic management. In recent years, there has been a spontaneous development of royalties for patents of scientific research achievements. With the talk that inventions make money, everyone scrambled at the same time to purchase the production technology of a product. This has also encouraged such blindness. After we establish the patent system we must correspondingly set up a system of bulletin of patent instructions, which will benefit solving the long-standing problem of duplication and waste. When the state grants patent right, we can go according to the needs of the national economic development, grant preferential treatment, absorb scientific and technical strength in a planned way and undertake certain major questions concerning the national economy and the people's livelihood. Therefore, in a certain sense, the socialist patent system is also an important regulatory tool that can be used by the socialist state to realize the national economic plan.

It is true that in capitalist countries there are quite a few monopoly groups which monopolize technological inventions as means to exclude competitors and maintain superprofit. They realize this primarily by using the absolute exclusive right in the capitalist patent system. Quite a few capitalist countries have the provision of so-called "monopoly license" or "exclusvie license": when a patented technology is sold to A then it cannot be sold to B, and even if the inventor himself wants to implement his invention it can be regarded as an "infringement of rights." In this way, some large monopoly groups pursue monopoly profits regardless of cost by buying up "monopoly" or "exclusive" licences. Some monopoly corporations even monopolize hundreds and thousands of patents and if they themselves do not use them they would rather let the patents become useless than allow competitors take away the technology. Such absolute exclusive rights are not used by many Third World countries. For the inventions in general for which China grants patent rights, only if the patentee agrees, once the patent license is purchased it can be carried out. If the patentee has no proper reason for refusing to carry out the patent controlled by him, the state can stop implementation according to law or remove his patent protection.

Marx said: "In all forms of society there is a certain kind of production which governs the position and influence of all other production, so that its relations also governs the position and influence of all other relations. This is a light that illuminates. All other colors are hidden in it which transforms their characteristics." (Complete Works of Marx and Engels, Vol 12, p 757) Socialist production relations are China's illuminating light. Under its radiance, the patent system which has previously served the capitalist system must naturally transform its characteristics and turn to serve socialism.

9586
CSO: 4008/108

JIANGXI GOVERNOR RECEIVES SCIENCE PROFESSOR

OW211209 Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 18 Oct 84

[Excerpts] Wn Yuankai, deputy to the NPC and associate professor modern chemistry department of the China Science and Technology University, arrived in Nanchang on 16 October to publicize experiences in reform at the invitation of the provincial Economic Commission, the provincial Enterprise Management Association, and the provincial Plant Managers Association for management research. He was warmly greeted by our province's party and government leaders and personages from the various plants, enterprises, and the educational, scientific, and technological circles.

During his 2-day stay in Nanchang, Wen Yuankai made the following three special-topic reports: "How To Foster Creative Talents," "We Have Seen the Dawn of Reform of Science and Technology Education," and "Persist in Reform; Meet the World Challenge of the New Technological Revolution."

Attending the report sessions were responsible persons of the provincial CPC Committee, the provincial Advisory Commission, Standing Committee of the provincial People's Congress, the provincial government, and the provincial CPPCC Committee, including Ni Xiance, Qian Jiaming, (Liu Shonghou), Xie Xianghuang, Liu Bin, and Lu Liang.

On the evening of 17 October, Zhao Zengyi, secretary of the provincial CPC Committee and provincial governor, and Ni Xiance, member of the Standing Committee, the provincial CPC Committee and vice provincial governor, received Comrade Wen Yuankai at the Jiangxi Guest House and highly appraised his work in the institutions of higher learning in Nanchang.

CSO: 4008/62

CONFERENCE DISCUSSES SCIENTIFIC, TECHNOLOGICAL WORK

HK200638 Chengdu Sichuan Provincial Service in Mandarin 2300 GMT 17 Oct 84

[Excerpts] According to a SICHUAN GONGREN BAO report, in a recent speech at the Sichuan provincial conference on the scientific and technological work of enterprises, Jiang Minkuan, deputy secretary of the provincial CPC committee and vice governor, emphatically pointed out: At present we should primarily rely on imports in our enterprise scientific and technological work, and we should adopt a policy of absorbing new things. We should introduce advanced and practical technology and equipment from foreign countries and other provinces and make them serve our needs after assimilating and absorbing them. At the same time, we should also carry out well the development and research of new products and technologies. Sichuan is lagging behind some other provinces and municipalities in technology and equipment. Under these circumstances, we can make fewer detours by introducing the existing technology and equipment of other people to our province than by developing them ourselves.

Jiang Minkuan also said that in their scientific and technological work, enterprises should not always try to engage in large and sophisticated projects. They should proceed from the actual conditions of the enterprises and concentrate on medium and small scientific and technological projects which have a strong bearing on the development of production.

Jiang Minjuan also pointed out that a weak link in the economy of our province is the medium and small enterprises. These enterprises have the greatest potential for development. The commission for science and technology at all levels and the departments in charge of economic work should pay attention to strengthening the scientific and technological work of medium and small enterprises by helping them to develop new products and to import new technologies.

CSO: 4008/62

BRIEFS

SCIENTIFIC GROUP TO FRANCE, ROMANIA, U.S.--Beijing, 25 Oct (XINHUA)--A Chinese science academy delegation led by Professor Lu Jiaxi, its president, left here today for Romania, France and the United States. Invited by the Romanian Academy of Sciences, the French National Scientific Research Center and the U.S. National Academy of Sciences, the delegation will discuss with their counterparts furthering bilateral scientific cooperation and exchange. The Chinese Academy of Sciences has signed scientific and technical cooperation agreements with the above-mentioned organizations. [Text] [Beijing XINHUA in English 0238 GMT 25 Oct 84 OW]

CSO: 4010/17

DETAILS OF EXPORT A-5 CLOSE-SUPPORT AIRCRAFT GIVEN

Beijing HANGKONG ZHISHI [AEROSPACE KNOWLEDGE MAGAZINE] in Chinese No 9, Sep 84 pp 12-13

[Article: "What Is the Performance of China's 'Qiang-5'?"]

[Text] Since making its appearance, the all-Chinese designed and built supersonic attack aircraft, "Qiang-5", has drawn the close attention of foreign aviation circles. In its 26 May 1984 issue, Britain's JANE'S DEFENSE WEEKLY, published an article written by (Dean Rikson), which reported in comparative detail the technical data, structure, and performance of the Qiang-5 aircraft, which we now provide as a reference. The publishing of this article does not mean that this magazine endorses the writer's viewpoints or confirms his report, but is done only to provide our readers with foreign materials that evaluate our aviation situation.

China's state aircraft industry has a strong production capacity, but still lacks comprehensive experience in specialized designs. Before 1960, China received constant technical assistance from the USSR, but when ideological differences between the two countries appeared and armed clashes erupted between them, this assistance was suddenly cut off. Only in the past 10 years, when China has looked beyond what is made in China and has sought new Western technology in order to improve its military posture, has it become clear that the obsolete Soviet-designed equipment is more and more unsuited to the demands of its military forces.

Up until 1960, China imported or produced in its own factories a large number of military aircraft, including the MiG-17, MiG-19, MiG-21, Il-28, Tu-16, and the An-24. The various types of Soviet-produced aircraft also became the equipment for the majority of China's zhongdui. However, after losing the Soviet Union's technical help, China's first design work was to take the MiG-19 airframe and add a nose and two air intakes on either side, calling the design modification the 'Qiang-5'. It was to perform an attack role.

It is said that 500 Qiang-5's are in service in Chinese units. In 1983, China began to export this aircraft, the export model being called the A-5. Pakistan's first order was for 42 A-5's, with which it equipped three squadrons. Its orders have now increased to 60 A-5's, and the 16th

Squadron stationed in (Lafeiqi Shaokete) was the first squadron to be equipped with A-5's. A second, newly formed A-5 squadron, had been sent to the (Masilu) Air Force Base.

The West long ago knew of the existence of this aircraft, its NATO designation being the Fantan-A, but mistakenly thought it to be the F-9, or a modified F-6. When a U.S. aircraft industry delegation visited China in 1980, Chinese reception personnel briefed the delegation on the true name of the aircraft at the Nanchang factory that produces it. To sell the A-5 abroad, China has provided all the technical data on it. We can now publish some photographs on the aircraft's structure and equipment as well as the experimental and design facilities used in its development.

For the Qiang-5, a large amount of redesigning was done on the airframe of the Jian-6 (China's production model of the MiG-19), with the improvements mainly concentrated in the mid-fuselage and forward fuselage. The aircraft is about 25 percent longer than the Jian-6. First, the forward fuselage was lengthened in order to add a weapons bay. It is known that the Qiang-5 produced in the early stage had a weapon bay, but the Qiang-5 produced in the recent stage uses this space to store fuel. The main improvements that make the exterior of the Qiang-5 completely different from the original model is that the [single] air inlet for the two WP-6 engines (similar to the early-stage Jian-6) has been changed to two lateral air inlets and a pitot boom has been fitted on the front of the elongated nose. The way the cockpit canopy is opened is different from that of the Jian-6, and the back sweep of the cockpit makes the dorsal fin smaller and the vertical tail larger. The entire fuselage is very clean, particularly on the latest export models, and the small bleed holes and air admission holes have been removed. But the present Jian-6 and the early-stage Qiang-5 have these air holes. The Qiang-5 has been refitted with a drouge chute located in the same position as that of the later-stage Jian-6, just under the rudder.

The main technical specifications of the A-5 export model provided by China are: wingspan 9.70 meters, length (including pitot boom) 16.727 meters, length (without pitot boom) 15.65 meters, height 4.51 meters, weight empty 6,494 kilograms, and maximum takeoff weight 9,530 kilograms. Carrying all its external load, the A-5 can take off at a weight not exceeding 12,000 kilograms. The mean aerodynamic chord of the wing is 3.097 meters, and the aircraft can operate with the center of the mean aerodynamic chord limited to between 31.5 percent and 38 percent.

The China National Aero-Technology Import and Export Corporation is China's sales department and the postal address of its general headquarters is P.O. Box 1671, Beijing. The A-5 introduced by this corporation is a single-seat, twin-engined supersonic attack aircraft. Its main mission is, at low altitude or minimum flying altitude, to make a high-seed penetration of the enemy's line of defense and carry out close air support for ground units. It can attack with bombs or rockets various ground targets, for example: infantry assembly points, rocket or missile launching sites, air force bases, communications and liaison centers, coastal shipping, and tank zhongdui. It is able at level flying or diving to execute its air-to-surface mission, and it uses air-to-air missiles and guns for self-defense.

The A-5 can perform aerobatics and has great maneuverability. At sea-level its maximum level flying speed is 1,210 kilometers per hour (with external load and with afterburning). At an altitude of 11,000 meters, it can fly at Mach 1.12 (without external load and with afterburning), or 1,190 kilometers per hour. At an attitude of 5,000 meters, its maximum climbing rate is 4,980 to 6,180 meters per minute (without external load and with afterburning), and its service ceiling is 16,000 meters.

Its takeoff speeds are 300 kilometers per hour (without external load and with flap at 15°) and 330 kilomters per hour (with full external load and with flaps at 25°). The takeoff distances are 700 to 750 meters (without external load and with flaps at 15°). And 1,250 meters (with full external load and with flaps at 25°). Its landing speed (using the brake-chute and with flap at 25°) is 278 to 307 kilomters per hour, and the landing run is 1,060 meters.

At an altitude of 11,000 meters, the A-5's range (with auxiliary fuel tanks at maximum fuel capacity) is more than 2,000 kilometers. The high-low-high operational radius (with full external load and without additional power) is 600 kilometers, and its low-low-low operational radius (with full external load and without afterburning) is 400 kilometers. The overloads are 7.5 g (wihtout external load), 6.5 g (with empty auxiliary fuel tank), and 5 g (with full bomb load or full auxiliary fuel tank). Its maximum limit Mach number is 1.5.

The two WP-6 engines are China's production models of the Soviet Union's Tumansky/Mikulin R-9BF-811 engine and are installed side by side in the rear fuselage, and have a maintenance interval of 200 flying hours. The rated power without afterburning is 2,600 kilograms, the afterburning rated power is 3,250 kilograms; fuel consumption rate is 0.94 without afterburning and 1.6 with afterburning.

The fuselage is of regular stress skin structure, is manufactured in two separate parts, and can be opened behind the wing's trailing edge, providing access to the engines. Fuselage mid-section waisting meets area-rule requirements for transonic speeds. Certain cockpit areas have armor protection so that the pilot can survive gunfire attacks.

The sweep angle of the center monoplane at one-fourth of the chord is 52.50°, and its tab has an anhedral angle of 4°. The wing's area is 27.95 square meters, and the span-chord ratio is 3.37. The wing is a stressed-skin, multi-spar box structure with recessed inboard flaps and outboard ailerons; there is 2 full-chord fence on each wing.

The all-moving tailplane is on the upper part of the rear fuselage, and its total area is 8.62 square meters with a moveable area of 5 square meters. The total area of the vertical tail and the rudder is 4.64 square meters. The hydraulically-operated wide-track landing gear is of the single-wheel type and is fitted with oleo-pneumatic shock absorbers. The main landing gear retracts into the wing, and the nose gear retracts forward into the fuselage.

The A-5 has five internal fuel tanks, three in the forward fuselage and two in the rear fuselage, with a total internal fuel capacity of 3,720 liters. A 760-liter auxiliary fuel tank can be attached to each pylon on the inner side of the underwing, and when bombs are attached to the inboard pylons a 400-liter auxiliary fuel tank can be attached to each outboard pylon.

The working pressure of the hydraulic system is 210 kilograms per square centimeter. The main hydraulic system telecontrols the landing gear's lowering and retraction, the flaps, the speed brakes, and the afterburner jet pipe. The auxiliary hydraulic system drives the booster for the ailerons and the ail-moving tailplane. But the rudder is mechanically operated, with the trim tabs for the ailerons and rudder being operated electrically.

The A-5 has eight external attachment points, four under the wing and four under the fuselage. Fuselage attachment points can carry a 250-kilogram bomb (China's 250-2, the U.S. MK 82, "Snake-Eye," or France's Durandal.) An attachment on the inner side of the wing can carry a 500-pound or 700-pound bomb; and can also carry a 57mm, 68mm, or 90mm rocket launching unit. After being refitted, a wing outboard attachment point can carry an AIM-9 "Sidewinder" or a "Matra R550 [magic]" air-to-air missile. An 23mm cannon is mounted in each wing root, with each cannon having 100 rounds. An SH-1J optical sighting device can be used for level and dive bombing or for firing air-to-surface rockets. The normal ammunition and bomb load capacity is 1,000 kilograms, but the maximum can be 2,000 kilograms.

According to the manufacturer's briefing, experimental work was widely conducted during the process of developing the A-5.

9727
CSO: 4008/10

GANSU: ELECTRONICS SECTOR OVERFULFILLS

HK171431 Lanzhou Gansu Provincial Service in Mandarin 1100 GMT 16 Oct 84

[Text] Propelled by the party rectification, the electronics industry sector in our province has vigorously carried out reform and quickened the pace of technological imports, technological transformation, and the trial-manufacture of new products by scientific research departments, thus attaining better economic results. It has succeeded in overfulfilling the annual plan for output value and profits 3 months ahead of schedule.

In the first 9 months of this year, the gross output value of the electronics industry throughout the province was 101 percent of the annual plan, an increase of 69.6 percent over the corresponding period last year. The enterprises under the provincial electronics corporation, such as (Xiaoguan) integrated circuit plant, Yongheng equipment plant, (Jinggong) machinery plant, (Rongguang) electron tube plant, and Lanzhou electronics enterprise, have overfulfilled their annual plans for gross output value. The output targets for principal products have also been overfulfilled ahead of schedule. The sales of products have markedly increased. By the end of September, 64,900 TV sets of various types had been sold, equivalent to 103.7 percent of output volume, and 12,700 recorders had been sold. The profits and taxes of these electronics enterprises have grown by big margins, totaling 17 million yuan, an increase of more than 200 percent over the corresponding period last year.

CSO: 4008/58

BRIEFS

HUNAN ELECTRONICS INDUSTRY--By the end of September, Hunan Province had fulfilled its 1984 quotas for gross electronics industrial output value, for profits, for submitting profits to the state, and for producing products of superior quality 3 months ahead of schedule. The province's gross electronics industrial output value was 101.6 percent of the 1984 quota and 53.6 percent more than in the same period last year. [Summary] [Changsha Hunan Provincial Service in Mandarin 2300 GMT 5 Oct 84 HK]

ANHUI ELECTRONICS INDUSTRY--The local electronics Industry has been developing rapidly in Anhui Province since the convocation of the 3d Plenary Session of the 11th CPC Central Committee. In the early 1950s, there were no electronics enterprises in this province. As of 1983, various electronics enterprises in Anhui could produce 300,000 television sets, 1.5 million radios, 5,000 microcomputers, 10,000 electronic surveying instruments, and 300 million parts per annum. The total output value of the electronic industry in this province during the first 8 months this year rose by 42 percent as compared with that in the same period last year. [Summary] [Hefei Anhui Provincial Service in Mandarin 1100 GMT 12 Sep 84 OW]

ELECTRONIC IMAGE RECORDING SYSTEM--Beijing, 11 Oct (XINHUA)--A new electronic beam digital image recording and dissecting system has recently passed the test of the Institute of Automation under the Academy of Sciences of China. The development of this new technology has blazened a new trail in China's film-making, television and microphotographic fields. It has also been widely used in space and remote sensing technology. China's experts consider this development as a creative achievement in high-resolution graphic processing and data storage. [Summary] Beijing XINHUA Domestic Service in Chinese 0235 GMT 11 Sep 84 OW]

HEBEI PEASANTS FIND LARGE 'ICELAND SPAR'--Shijiazhuang, 23 Oct (XINHUA)--A natural iceland spar--a nonmetallic crystal indispensable for making astronomical telescope lenses--found by six Hebei peasants has been classified as "extremely rare in size" by experts. The spar, found recently by Li Huaixing and five others in Chengde County while digging, weighs 2.6 kilograms and is 1,034 cubic centimeters in size. It is worth 30,000 yuan (about 13,600 U.S. dollars). The crystal is also used in laser research. [Text] [Beijing XINHUA in English 0854 GMT 24 Oct 84 OW]

ARSENIC IN BOHAI BAY STUDIED

Qingdao SHANDONG HAIYANG XUEYUAN XUEBAO [JOURNAL OF SHANDONG COLLEGE OF OCEANOLOGY] in Chinese No 2, Jun 84 pp 27-39

[Article by Li Quansheng [2621 0356 3932], Shen Wanren [3088 8001 0088] and Ma Xinian [7456 6932 1628], all of the Institute of Oceanology, Chinese Academy of Sciences: "A Study of Arsenic in Bohai Bay"]

[Summary] Observations of the arsenic in Bohai Bay were made during two cruises. Some primary conclusions are as follows:
1. The average levels (1.79μg^{-1} and 2.04 μgl^{-1}) of dissolved arsenic concentrations in the surface waters of Bohai Bay are higher than those in oceans, but their differences are not significant. The horizontal distribution has an obvious gradient, with a decrease from the northwest toward the southeast. However, the vertical distribution is relatively uniform.
2. The major factors affecting the variation of the arsenic concentrations and their gradient of horizontal distribution are the inputs from the Jiyun River, Yongdingxin River and Haihe River.
3. The salinity ranged from 27 to 32 per-thousand within almost the entire region of the bay during these two cruises. A good negative correlation exists between dissolved arsenic concentrations and salinities in the surface water of the bay. This suggests that the behavior of dissolved arsenic in the bay is of a conservative nature.
4. The average arsenic content in the surface layer of sediments is 13.8 ppm. This value is within the variation range of 5-15 ppm of arsenic contents in shale, and is close to the background value (10 ppm) of oceanic sediments.
5. Rain and dust fall from the atmosphere is probably a significant source of arsenic for this bay.

9717
CSO: 4009/137

BRIEFS

SHANGHAI BIOLOGICAL ENGINEERING COMPANY-- Shanghai, 17 Oct (XINHUA)-- A new company to develop biological technology has been set up in Shanghai. The Shanghai Global Biological Technology Development Co Ltd will import advanced technology and export biological products. It will promote biological engineering technology in China and provide technical training and consultancy services. The company was established by the Shanghai Municipal Science and Technology Association and three other units. Professor Tan Jiazhen, director of the Genetics Institute of Fudan University, is the company's chairman. [Text] [Beijing XINHUA in English 0634 GMT 17 Oct 84 OW]

CSO: 4010/16

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ORG: None

TITLE: "The Probability of Detection in the Theory of Search"

SOURCE: Beijing BINGGONG XUEBAO [ACTA ARMAMENTARII] in Chinese No 3, Aug 84 pp 14-20

TEXT OF ENGLISH ABSTRACT: This paper suggests a mathematical model which can be applied to some air-to-surface search processes and to the "effective search time," a concept which is of great significance in the calculation of the probability of detection. The paper discusses the simulation of the search process under conditions of both scanning and not scanning. In this paper, two formulas for calculating the probability of detection are given with the detection equipment operating in the mode of pulse signals and continuous signals (the jamming is a Poisson Process).

AUTHOR: JIANG Fan [5592 0416]
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TITLE: "The SEM Examination of Molybdenum Nozzle and Investigation of Erosion Mechanism"

SOURCE: Beijing BINGGONG XUEBAO [ACTA ARMAMENTARII] in Chinese No 3, Aug 84 pp 31-35

TEXT OF ENGLISH ABSTRACT: An examination has been made with SEM of a molybdenum nozzle of an anti-tank missile after having passed the firing test. The erosion mechanism of the molybdenum nozzle is investigated, including all factors such as plasticity-cohesiveness fluxion, mechanical abrasion, cold-hot brittle crack, eutectic melting, chemical corrosion, etc. The results depend on the physical, mechanical and chemical properties of the material of which the nozzle is made and on the properties of the propellant, wrapping coat, insulating coat and combustor. Measures are correspondingly taken for relieving erosion.

AUTHOR: LI Jingyun [2621 2529 0061]

ORG: None

TITLE: "A Method of Engineering Computation for Lethal Area of Fragmentation Ammunition"

SOURCE: Beijing BINGGONG XUEBAO [ACTA ARMAMENTARII] in Chinese No 3, Aug 84 pp 36-45

TEXT OF ENGLISH ABSTRACT: The lethal area of fragmentation ammunition is generally determined in accordance with fragmentation tests, spherical target tests and velocity measurement tests. In this paper, the spatial distribution of fragments is approximated to normal distribution and the decrease of the effective fragments with the travelling distance increasing is deduced. The author uses the present formula of fragment number-fragment weight and of estimating velocity. Then a method of the theoretical computation of the lethal area is developed. Four warheads are examined with this method and the results show clearly that the theoretical computation corresponds well with the experiment. This method can be used to predict the lethal area of various kinds of fragmentation ammunition and to prove different ammunition designs.

9717
CSO: 4009/139

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TITLE: "Accurate Measurements of the Wavelength Ratios in Vacuum Between Methane and Iodine Stabilized He-Ne Lasers"

SOURCE: Beijing JILIANG XUEBAO [ACTA METROLOGICA SINICA] in Chinese No 3, 1984 pp 188-193

TEXT OF ENGLISH ABSTRACT: The principle and constructional features of a precise interferometer developed for measuring the wavelengths of visible and infrared laser are described. With this interferometer the wavelength ratios in a vacuum between methand and iodine stabilized He-Ne lasers have been measured. The ratios between ν_3 band P (7) line $F_1^{(2)}$ component of CH_4 and the "i" and "f" components of $^{127}I_2$ are R (i) = 5.359 048 177 and R (f) = 5.359 049 762 respectively, with a measuring uncertainty of $\pm 2.3 \times 10^{-9}$.

AUTHOR: PAN Xiaohong [3382 1321 3163]

ORG: None

TITLE: "A Standard Apparatus for Underwater Sound Pressure by Using the Free-field Reciprocity Method"

SOURCE: Beijing JILIANG XUEBAO [ACTA METROLOGICA SINICA] in Chinese No 3, 1984 pp 194-197

TEXT OF ENGLISH ABSTRACT: This paper describes the principle, construction and experimental results of the standard apparatus for underwater sound pressure by using the free-field reciprocity method. The total uncertainty of this apparatus is less than ±0.7 dB within the frequency range of 2-200 kHz.

9717
CSO: 4009/21

AUTHOR: ZHONG Jingchang [6988 2529 2490]

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TITLE: "The MBE Growth of GaAs-$Ga_{\chi}Al_{1-\chi}As$ DH Lasers"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese No 6, 1984 pp 494-498

TEXT OF ENGLISH ABSTRACT: The growth conditions for MBE-grown GaAs-$Ga_{\chi}Al_{1-\chi}As$ DH lasers are reported, which include the temperature-time cycles with a lower growth temperature, in-situ growth of ohmic contact electrode layer, and an annealing process after growth. The experiments indicate that the use of source materials with high purity, BN effusion cells and the cryopump in the system play important roles in reducing the threshold current density of the lasers and improving their optical and electrical performance.

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TITLE: "Application of Optogalvanic Effect in Probing the Properties of CO Gas Laser Medium"*

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese No 6, 1984 pp 507-512

TEXT OF ENGLISH ABSTRACT: Some new applications of the optogalvanic spectroscopy technique are proposed in the present paper. Under fixed discharge conditions, using the intra-cavity optogalvanic technique, the saturation parameters of the CO laser medium and its dependence on the temperature and current have been measured. By measuring small-signal optogalvanic signal responsivity, the gain distribution and the ratio of the population of vibrational levels have been obtained and the resonance self-absorption of a few lines has been observed. The method is simple and rapid, so it may be used for real-time measurement of some dynamic parameters in gas lasers.

*This paper was presented at the 1983 ICL (Guangzhou, China).

9717
CSO: 4009/19

END